COVID-19 and herpes zoster co-infection presenting with trigeminal neuropathy.

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ABSTRACT

Background: Varicella-zoster virus (VZV) is a human neurotropic virus that remains in a latent state within ganglionic neurons throughout the entire neuroaxis after the primary infection. Whenever herpes zoster leads to trigeminal involvement, the ophthalmic division is the most implicated. COVID-19 emerged as a viral cause of severe acute respiratory syndrome that spread all over the world in the last months. Co-infection with COVID and other viruses has been registered, but sparsely and embracing the respiratory ones.

Methods: report a case of a co-infection of COVID-19 with VZV, and review the literature.

Results: 39-year-old immunocompetent man with oligosymptomatic infection by COVID-19 evolved to left facial herpes zoster affecting the three divisions of trigeminal nerve. The co-infection was remotely registered with other respiratory virus, being influenza the most mentioned. However, the present case is associated to the emergence of a latent virus infection, which might be related to the viral inflammatory response, especially ascending from the nasal cavity, where trigeminal branches are also placed.

Conclusions: The emergence of the latent infection by VZV under a rare presentation might illustrate the impact at least locally of COVID-19, once retrograde reactivation of VZV was possibly induced in a young immunocompetent patient.

KEYWORDS: COVID-19, herpes zoster, trigeminal, co-infection

INTRODUCTION

Varicella-zoster virus (VZV) is a human neurotropic virus that migrates to a latent state within ganglionic neurons throughout the entire neuroaxis after the primary infection (“chickenpox”).[1]

Coronavirus, one of the major pathogens targeting the human respiratory system, had featured outbreaks of public health threat. After severe acute respiratory syndrome (SARS)-CoV and the Middle East respiratory syndrome (MERS)-CoV, we

experience the rise of the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) or COVID-19[2]. Here we report the co-infection of VZV and COVID-19.

CASE REPORT

On March 25th, a previously healthy 39-year-old man was admitted to an emergency room (ER) presenting left orofacial herpes zoster (HZ) embracing the left three trigeminal divisions with intraoral mucosal lesions. The patient had chickenpox at childhood. No history of recurrent or opportunistic infections or use of immunosuppressive drugs was reported.

At examination, he was fully alert, oriented and had neither sign of meningism, vestibular disturbance nor facial palsy. He complained about sharp left hemifacial pain, especially during chewing, and hypogeusia for sweet. He had no visual acuity impairment, just photosensitivity. Fundoscopy was normal.

From the last ten days, he noticed fatigability and presented occasional diarrheic episodes, followed by left trigeminal neuralgia. On March 22th, three days after the beginning of the neuralgia, he presented low fever episodes, when he sought an ER for the first time. He had still no cutaneous lesion and was discharged with symptomatic drugs; however, at the end of that day, a papulovesicular rash emerged. His assistant physician prescribed oral acyclovir and pregabalin but no improvement was observed. Therefore, he went back to the ER unit two days later, on March 25th.

At his second visit to ER, blood analysis was normal and showed WBC: 6,0 10^3/µL (22% of lymphocytes), HB: 14,7g/dL, platelets: 246 10^3/µL, GGT: 19 UI/L, ALP: 61 UI/L, AST: 18UI/L, ALT: 33 UI/L, AST: 18UI/L, Urea: 23mg/dL, Cr: 1,07mg/dL, DHL:166 UI/L CRP: 0,45UI/L. Varicella-Zoster IgM serology was positive. HIV-serology test was negative and immunoglobulines levels were normal. Brain MRI demonstrated left trigeminal nerve enhancement. It was started intravenous Acyclovir 10mg/Kg t.i.d. After 24 hours of treatment, there was a remarkable clinical improvement. On the fifth day, the patient had already stopped the progression of herpes-zoster lesions without fever or respiratory symptoms (figure).

In his medical history, he could be exposed to COVID-19 on two different occasions: on a cruise coming from United Arab Emirates that arrived in Brazil on March 7 th and in a meeting on March 14th with a friend recently arrived from the US.

Due to the current pandemic, a nasopharyngeal swab specimen was collected to investigate COVID-19 infection by the PCR-RT technique and the result turned out positive.

DISCUSSION

In December 2019, Wuhan reported the first cases of pneumonia caused by COVID-19.[3] Since then, COVID-19 has spread all over the world with major outbreaks in China, South Korea, Italy, and Iran.[4] Viruses co-infection with COVID-19 has been reported with other respiratory agents, such as influenza.[3,4] Ding et al (2020) registered five cases of influenza among 115 Chinese inpatients positive for COVID-19.[3,4] This concurrency was probably favoured by seasonality. In the US, it was reported a co-infection with another respiratory virus, Metapneumovirus.[5] However, there is still no report involving co-infection with a latent non-respiratory virus.

VZV tend to remain in a latent state, which is probably related to neuronal resistance to VZV-induced apoptosis.[1] For example, the herpesviruses themselves facilitate this escape by downmodulating the expression of surface ligands that are targeted to natural killer cells. However, these ligands are upregulated following various stress conditions, as a viral infection.[6] The stress condition maintenance, in turn, seems necessary to allow virus reactivation progression[7]. In this case, the infection by COVID-19 might be the stress factor.

The reactivation of HZ affects the sensory ganglion and its cutaneous nerve; cranial nerve dermatomes are less affected than truncal ones. For cases involving the trigeminal nerve, the ophthalmic division is the most implicated.[8] The affection of the three divisions is rare and was punctually reported in immunocompetent patients under 50 years old.[9,10]

There is already evidence of COVID-19 role in the development of a cytokine storm in a subgroup of patients with severe infection.[11] Even the current patient remaining oligosymptomatic for COVID-19, the viral presence and its inflammatory potential arising from nasal cavity – which is also innervated by ophthalmic and maxillary branches of trigeminal nerve[12] – might have fostered retrograde reactivation of VZV and underlined this rare presentation of HZ.

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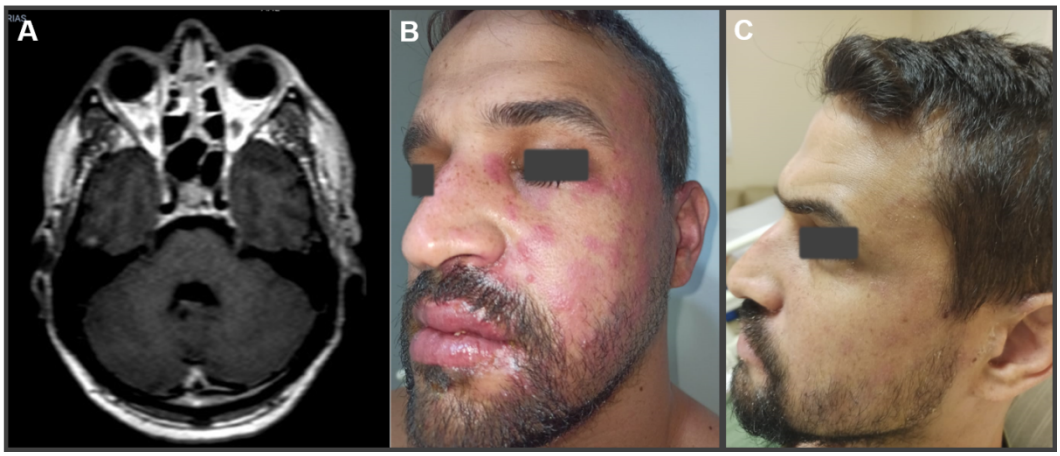

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